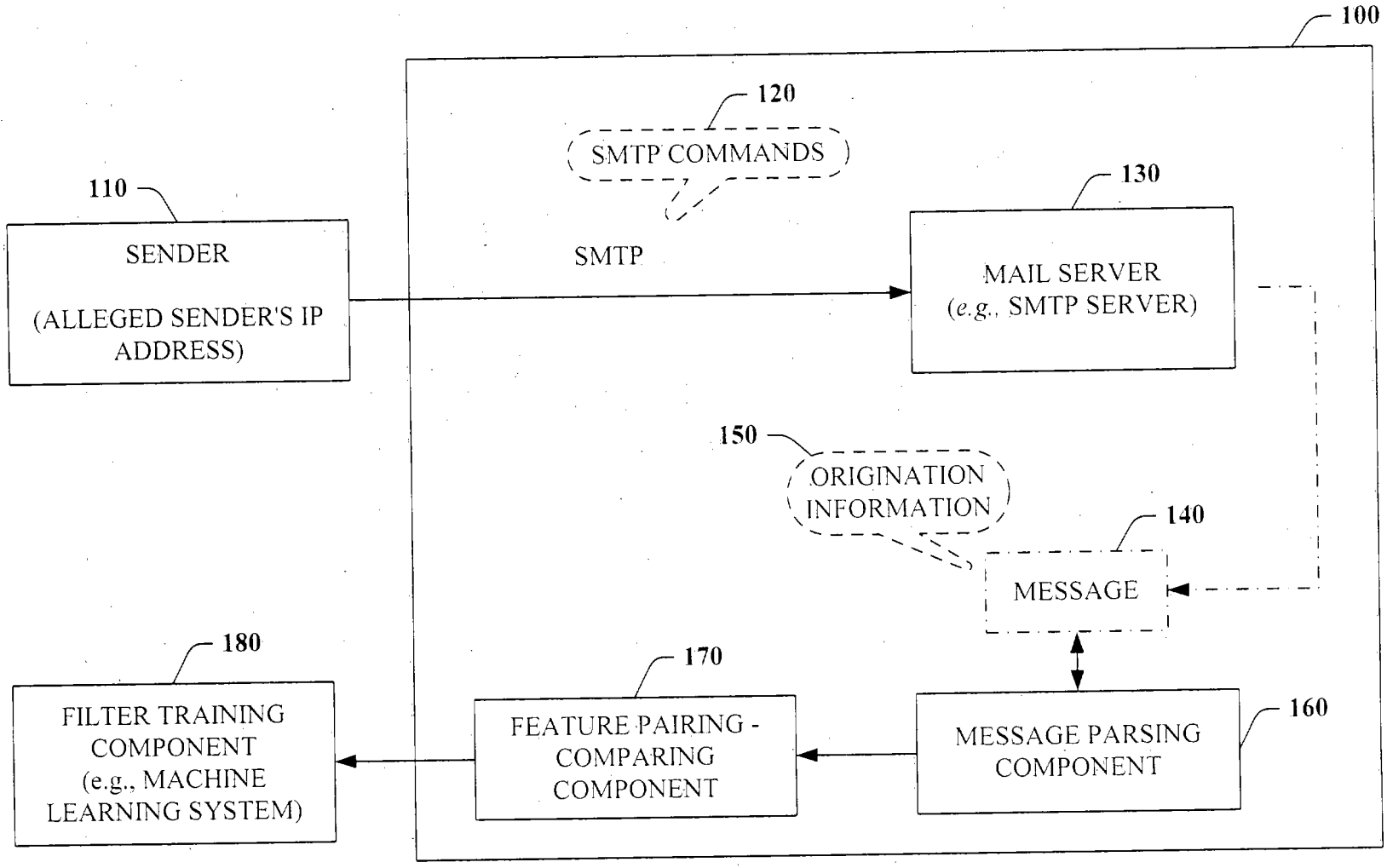
100
120
SMTP COMMANDS
110
SENDER
(ALLEGED SENDER'S IP ADDRESS)
SMTP
130
MAIL SERVER
(e.g., SMTP SERVER)
150
ORIGINATION INFORMATION
140
MESSAGE
180
FILTER TRAINING COMPONENT
(e.g., MACHINE LEARNING SYSTEM)
170
FEATURE PAIRING - COMPARING COMPONENT
MESSAGE PARSING COMPONENT
160

FIG. 1

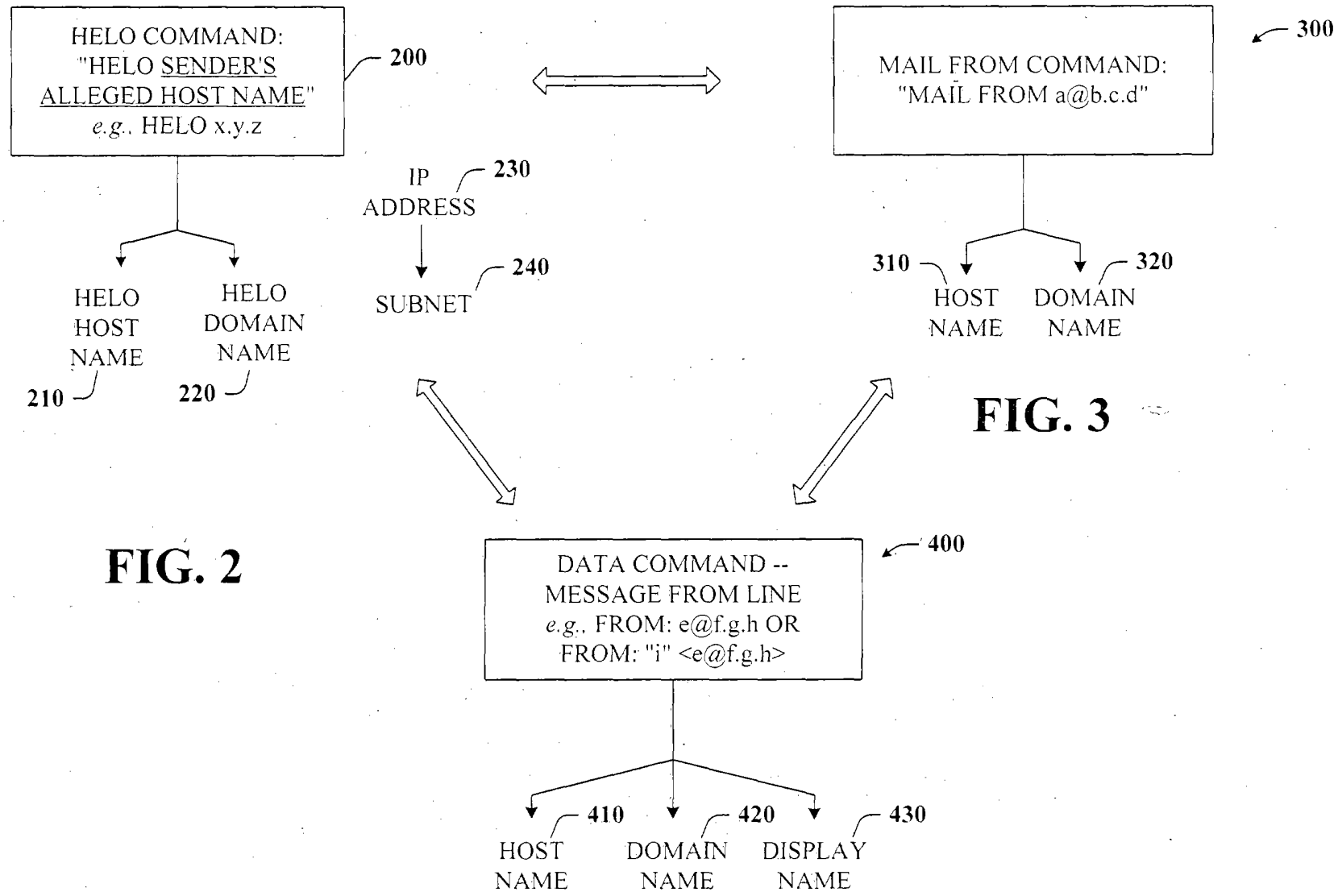

FIG. 2

FIG. 3

FIG. 4

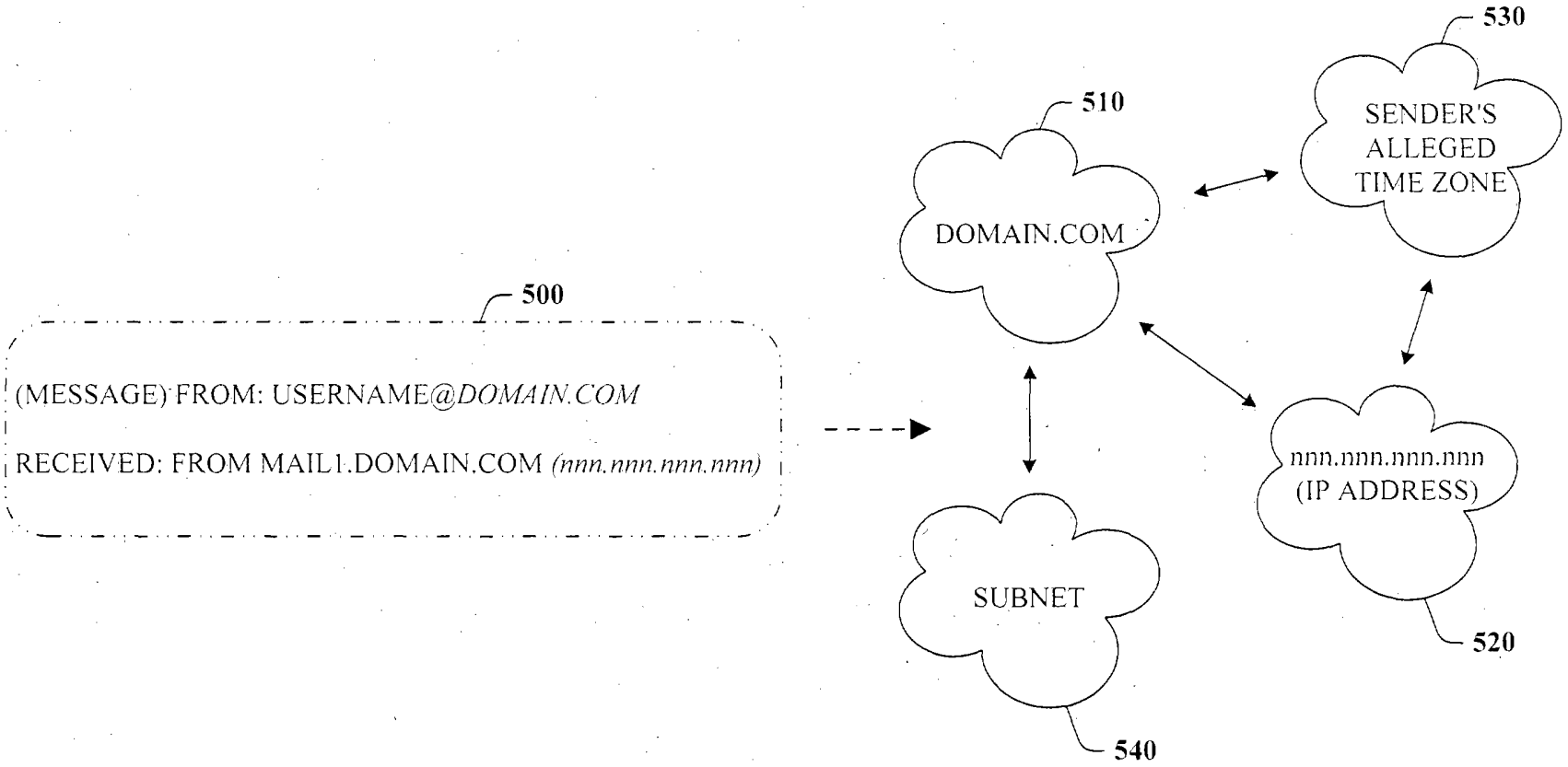
500
(MESSAGE) FROM: USERNAME@DOMAIN.COM
RECEIVED: FROM MAIL1.DOMAIN.COM (nnn.nnn.nnn.nnn)
510
DOMAIN.COM
530
SENDER'S ALLEGED TIME ZONE
nnn.nnn.nnn.nnn (IP ADDRESS)
520
SUBNET
540

FIG. 5

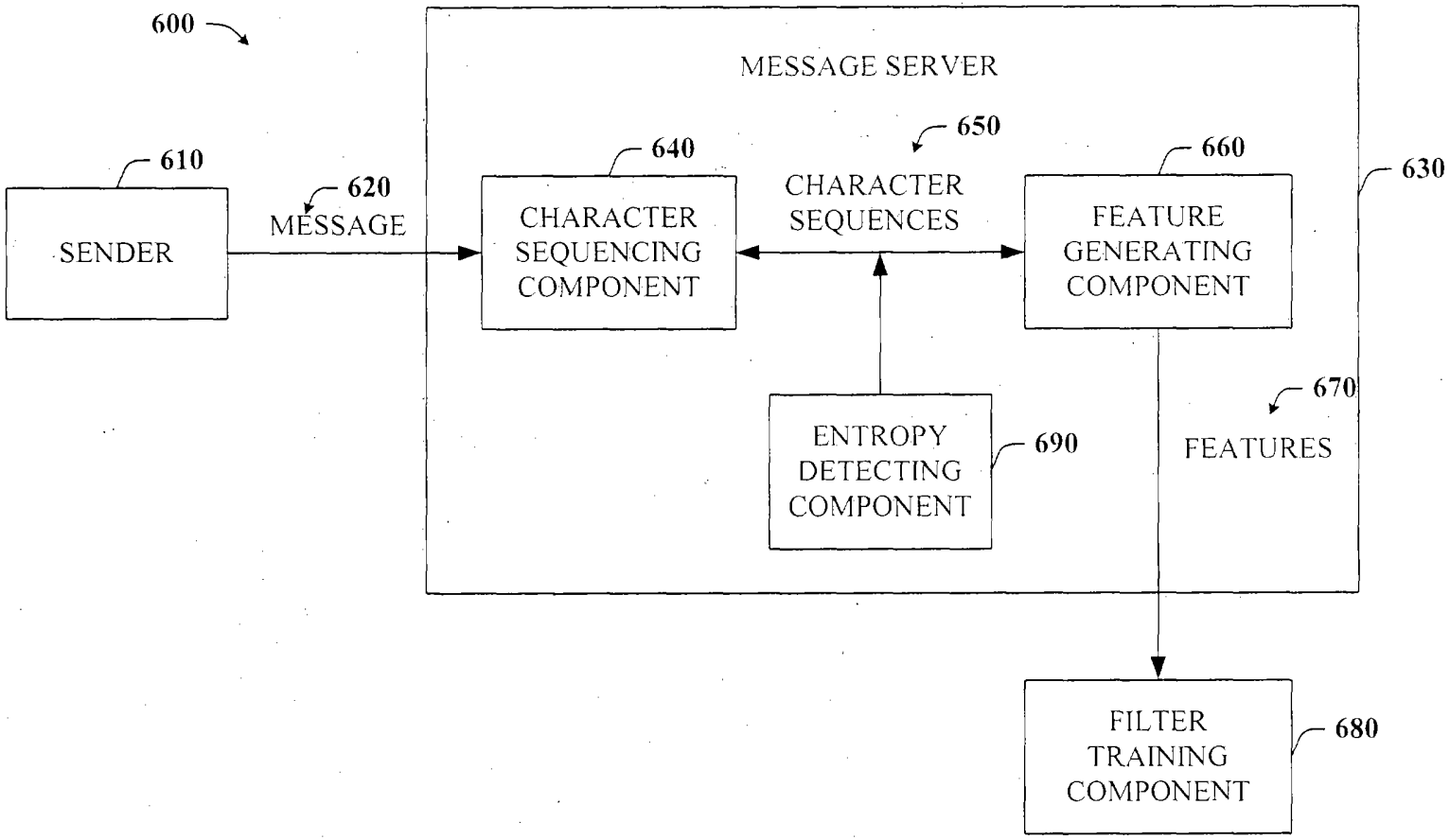
600
MESSAGE SERVER
610
SENDER
620
MESSAGE
640
CHARACTER SEQUENCING COMPONENT
650
CHARACTER SEQUENCES
660
FEATURE GENERATING COMPONENT
630
670
FEATURES
ENTROPY DETECTING COMPONENT
690
FILTER TRAINING COMPONENT
680

FIG. 6

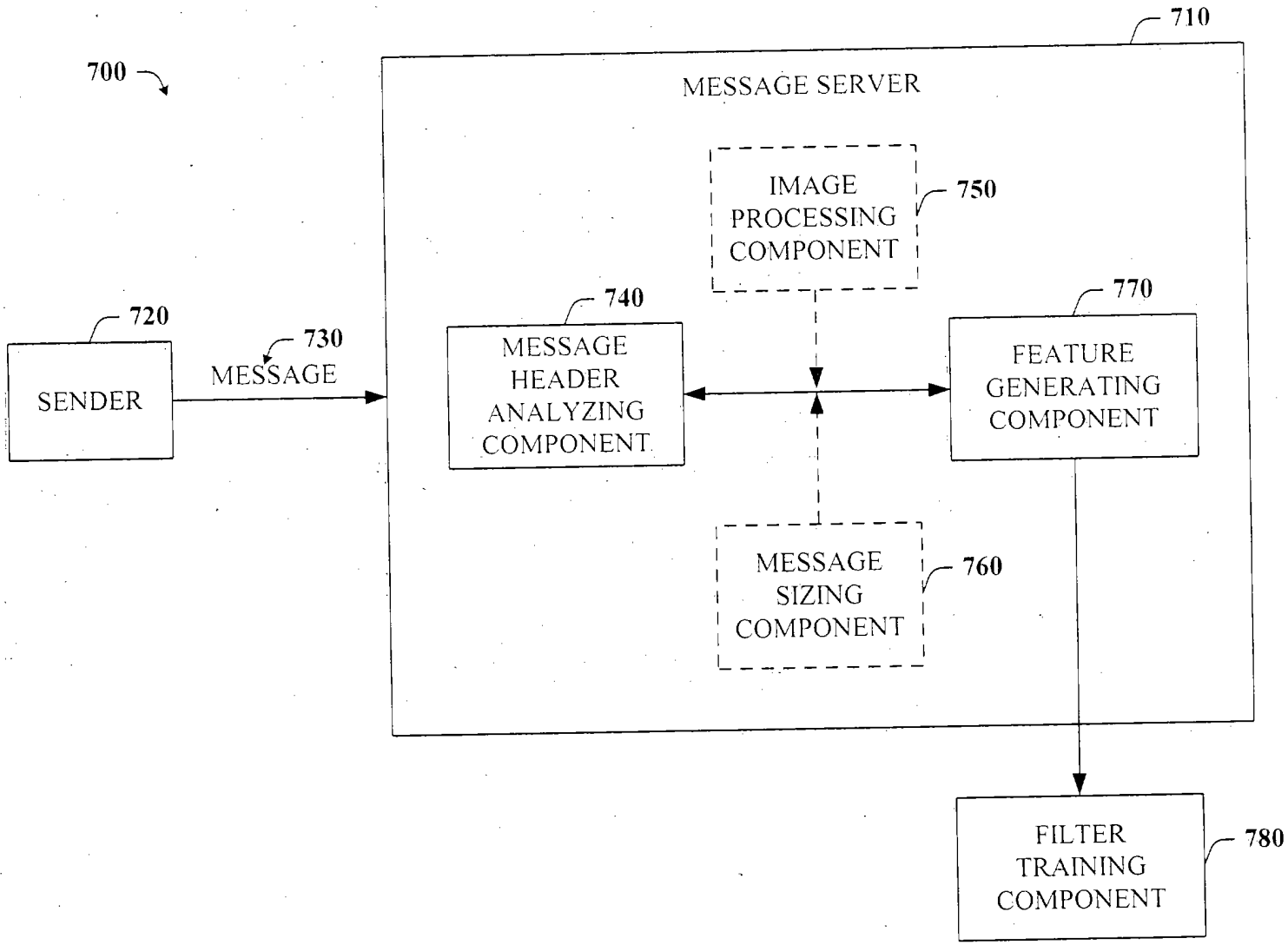
700
710
MESSAGE SERVER
IMAGE PROCESSING COMPONENT
750
740
770
720
730
MESSAGE
SENDER
MESSAGE HEADER ANALYZING COMPONENT
FEATURE GENERATING COMPONENT
MESSAGE SIZING COMPONENT
760
FILTER TRAINING COMPONENT
780

FIG. 7

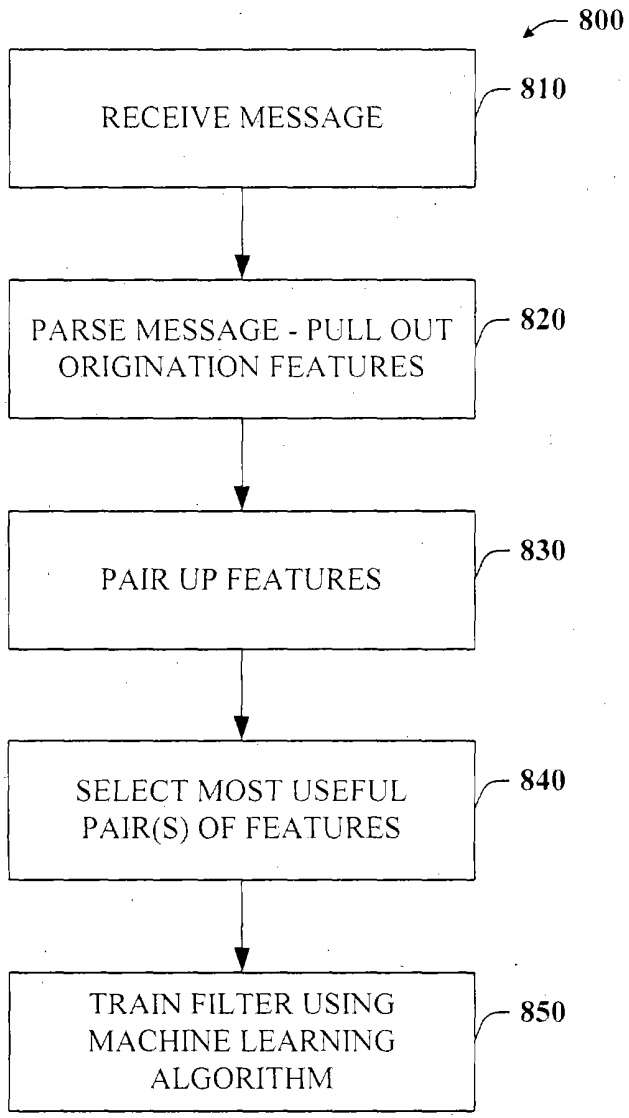
800
RECEIVE MESSAGE
810
PARSE MESSAGE - PULL OUT ORIGINATION FEATURES
820
PAIR UP FEATURES
830
SELECT MOST USEFUL PAIR(S) OF FEATURES
840
TRAIN FILTER USING MACHINE LEARNING ALGORITHM
850

FIG. 8

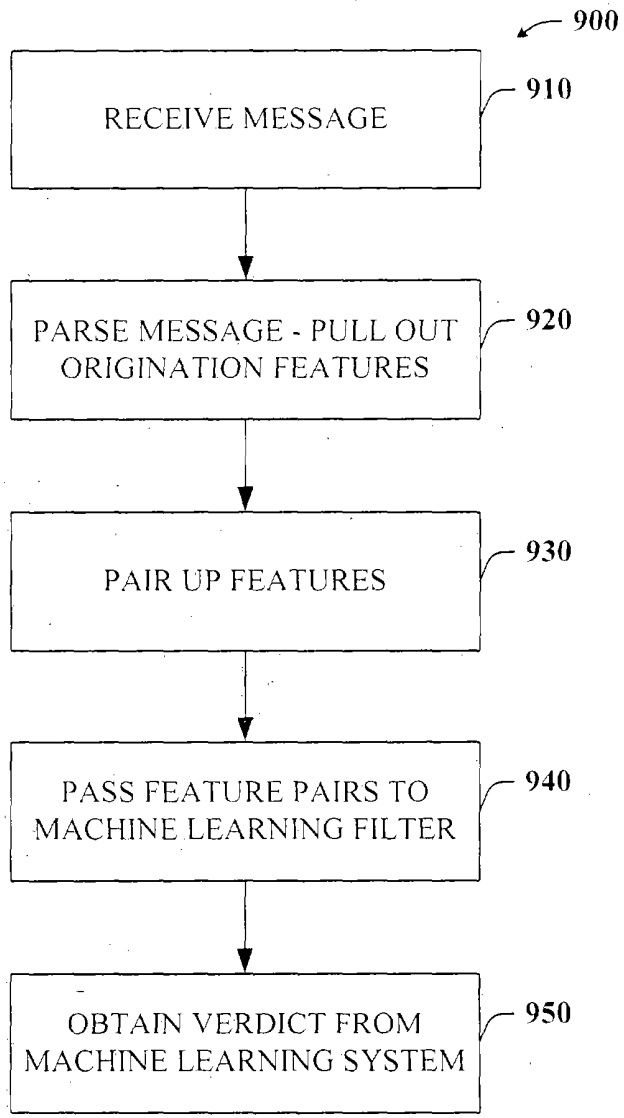
900
RECEIVE MESSAGE
910
PARSE MESSAGE - PULL OUT ORIGINATION FEATURES
920
PAIR UP FEATURES
930
PASS FEATURE PAIRS TO MACHINE LEARNING FILTER
940
OBTAIN VERDICT FROM MACHINE LEARNING SYSTEM
950

FIG. 9

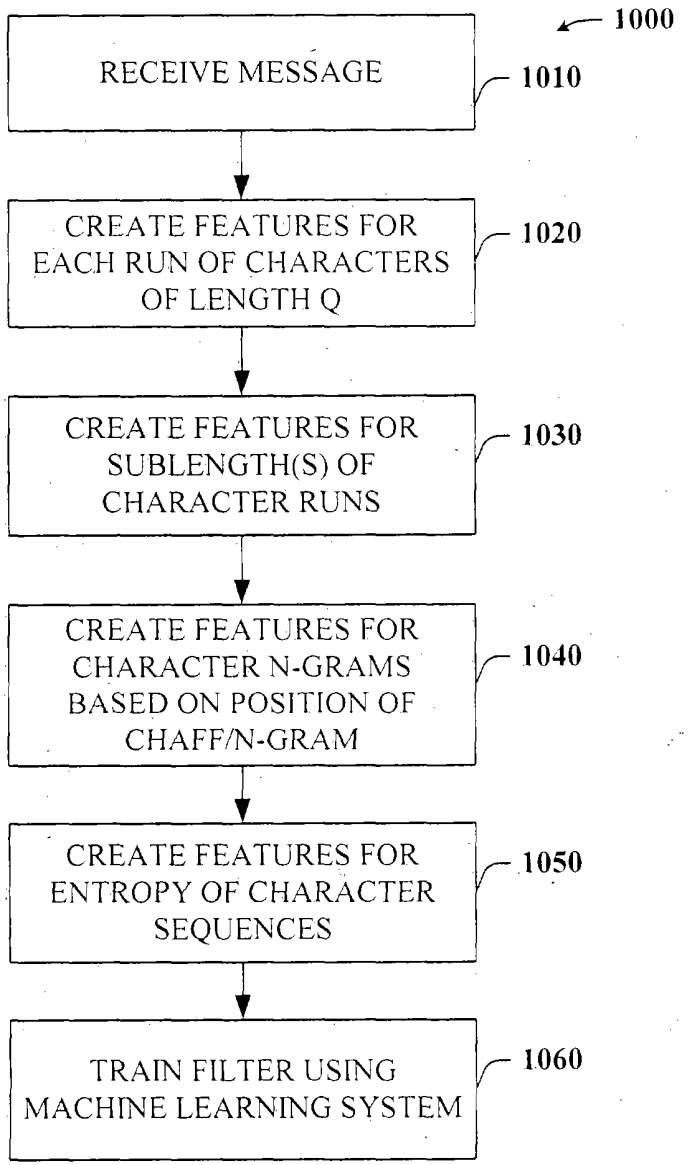
1000
RECEIVE MESSAGE
1010
CREATE FEATURES FOR EACH RUN OF CHARACTERS OF LENGTH Q
1020
CREATE FEATURES FOR SUBLENGTH(S) OF CHARACTER RUNS
1030
CREATE FEATURES FOR CHARACTER N-GRAMS BASED ON POSITION OF CHAFF/N-GRAM
1040
CREATE FEATURES FOR ENTROPY OF CHARACTER SEQUENCES
1050
TRAIN FILTER USING MACHINE LEARNING SYSTEM
1060

FIG. 10

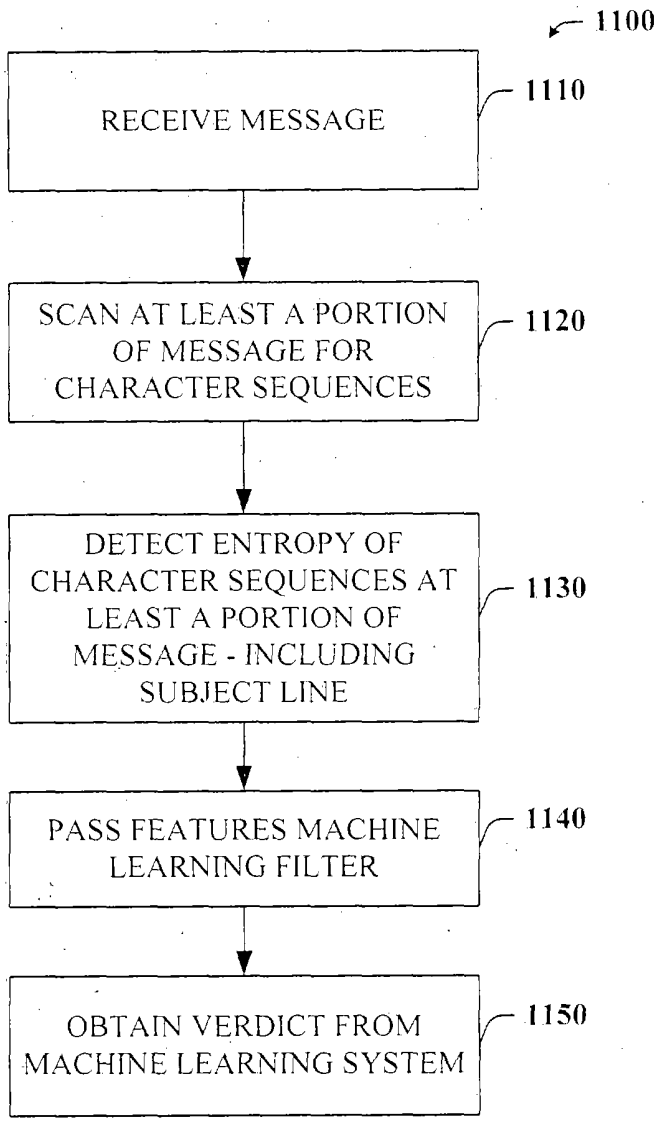
1100
RECEIVE MESSAGE
1110
SCAN AT LEAST A PORTION OF MESSAGE FOR CHARACTER SEQUENCES
1120
DETECT ENTROPY OF CHARACTER SEQUENCES AT LEAST A PORTION OF MESSAGE - INCLUDING SUBJECT LINE
1130
PASS FEATURES MACHINE LEARNING FILTER
1140
OBTAIN VERDICT FROM MACHINE LEARNING SYSTEM
1150

FIG. 11

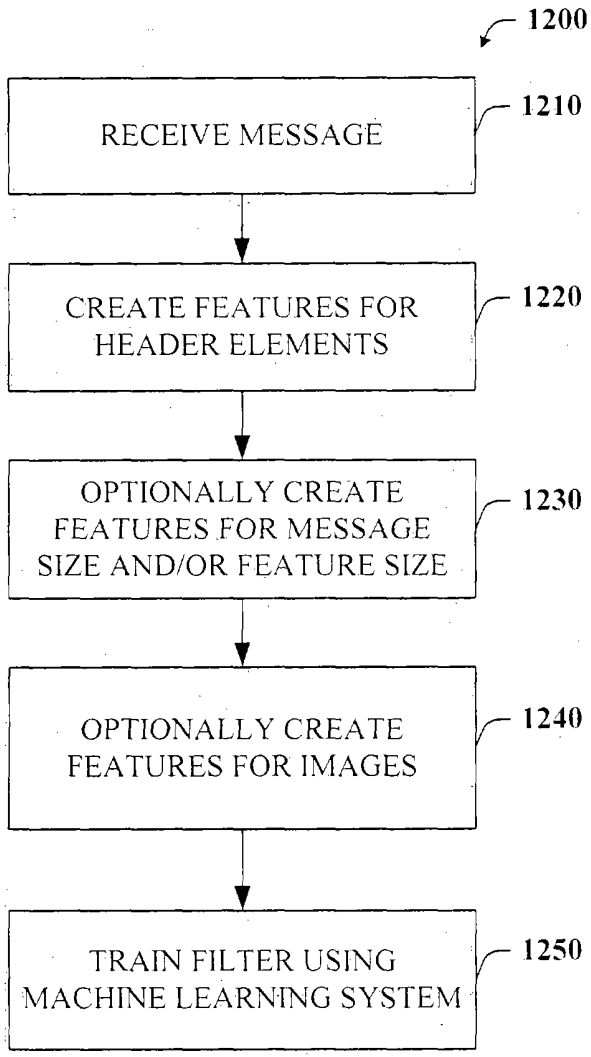
1200
RECEIVE MESSAGE
1210
CREATE FEATURES FOR HEADER ELEMENTS
1220
OPTIONALLY CREATE FEATURES FOR MESSAGE SIZE AND/OR FEATURE SIZE
1230
OPTIONALLY CREATE FEATURES FOR IMAGES
1240
TRAIN FILTER USING MACHINE LEARNING SYSTEM
1250

FIG. 12

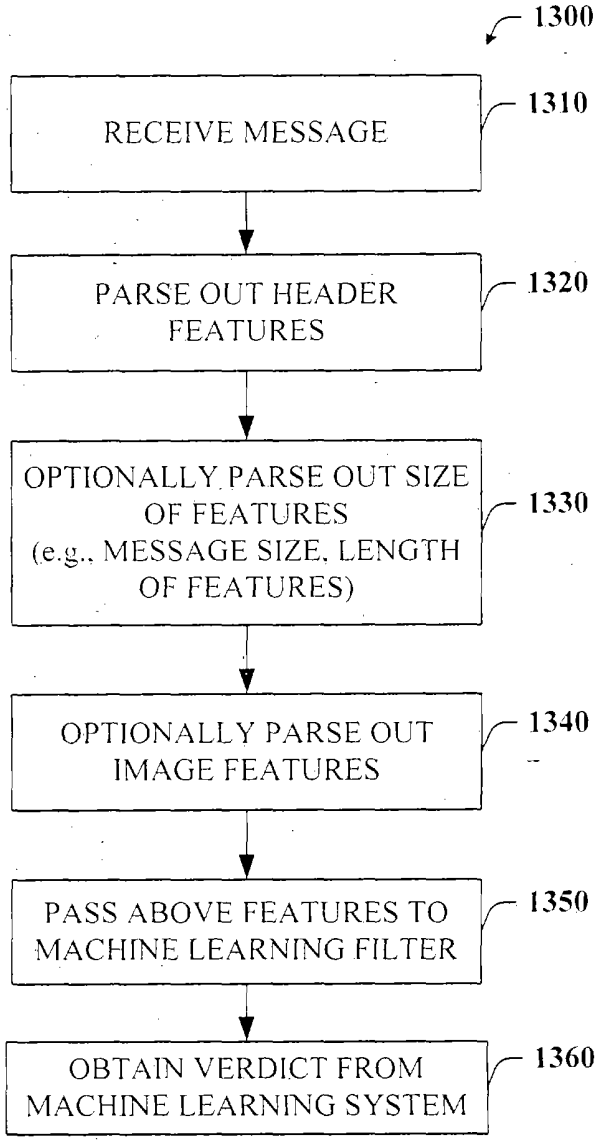
1300
RECEIVE MESSAGE
1310
PARSE OUT HEADER FEATURES
1320
OPTIONALLY PARSE OUT SIZE OF FEATURES (e.g., MESSAGE SIZE, LENGTH OF FEATURES)
1330
OPTIONALLY PARSE OUT IMAGE FEATURES
1340
PASS ABOVE FEATURES TO MACHINE LEARNING FILTER
1350
OBTAIN VERDICT FROM MACHINE LEARNING SYSTEM
1360

FIG. 13

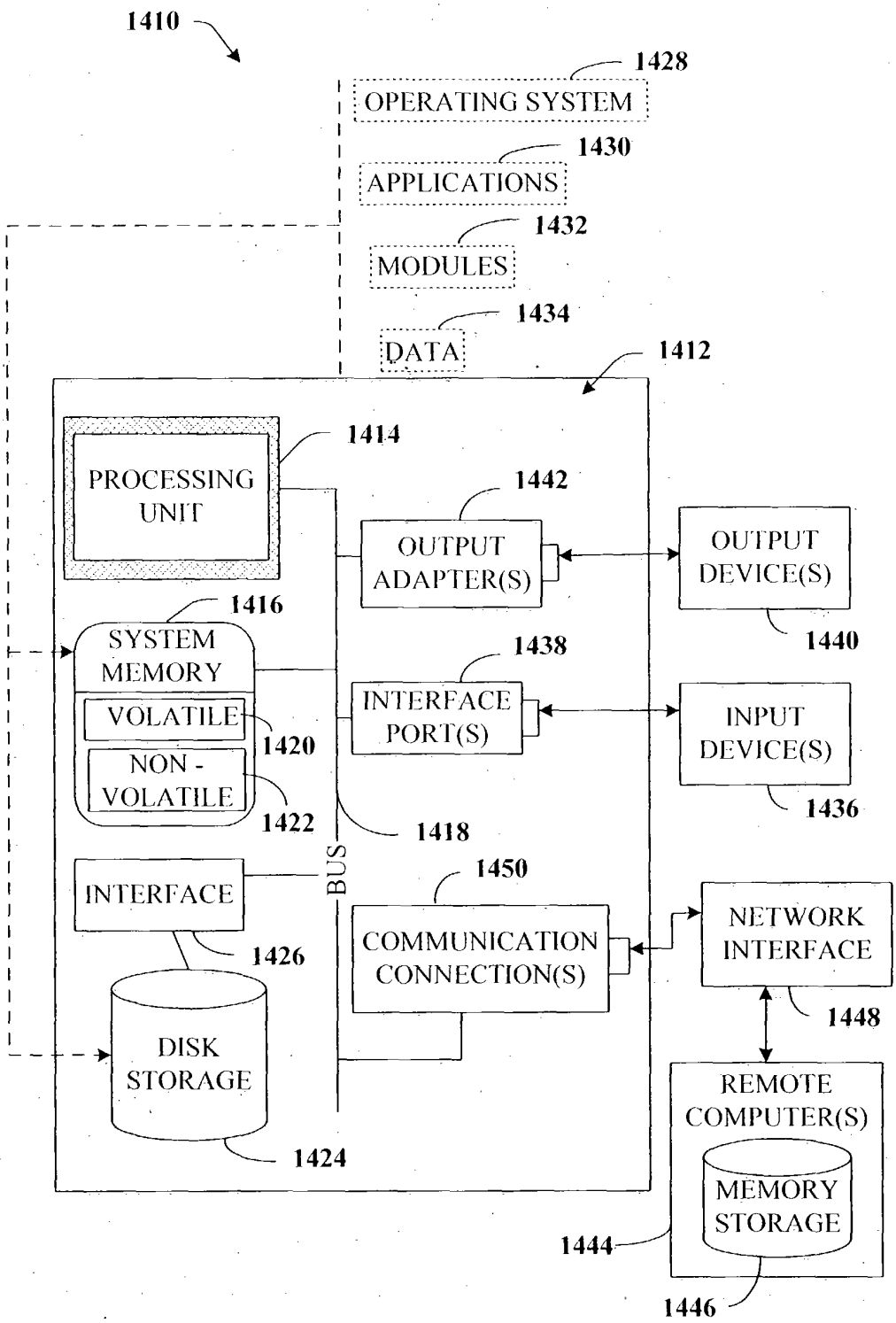
1410
1428
OPERATING SYSTEM
1430
APPLICATIONS
1432
MODULES
1434
DATA
1412
1414
PROCESSING UNIT
1442
OUTPUT ADAPTER(S)
OUTPUT DEVICE(S)
1440
1416
SYSTEM MEMORY
VOLATILE
1420
NON - VOLATILE
1422
1438
INTERFACE PORT(S)
INPUT DEVICE(S)
1436
1418
BUS
INTERFACE
1426
1450
COMMUNICATION CONNECTION(S)
NETWORK INTERFACE
1448
DISK STORAGE
1424
REMOTE COMPUTER(S)
MEMORY STORAGE
1444
1446

FIG. 14